THE ELECTRICAL EEL.

THE governor of New Amsterdam had a large electrical eel, which he kept for several years in a tub made for that purpose, and placed under a small shed near to his house. Two sailors, wholly unacquainted with its properties, were, one day, told to fetch an eel which was lying in a tub, and to give it the cook to dress for dinner. No sooner had they reached the shed than one of them plunged his hand to the bottom of the tub to seize the eel, when he received a blow which benumbed his whole arm; and without knowing how this could be, he started from the tub, shaking his fingers, and holding his elbow with the hand of his other arm, cried out, "I say, Jack, what a thump he has fetched me with his tail!"

His messmate, laughing at "such a foolish notion" as a violent blow from the tail of an eel, next put down his hand to capture the animal, but he, receiving a similar shock, also snapped his fingers, and ran out exclaiming, "Why, he did give you a thump! He's a fighting fellow: he has fetched *me* a broadside too! Let's both have a haul at him together, Jack; then we shall board his slippery carcase in spite of his rudder." Accordingly they both plunged their hands into the tub, and seized the eel, fully grasping it around the body. As this was rougher treatment than the animal commonly experienced, he returned it with a most violent shock, which caused the sailors instantly to quit their hold. For a moment they stood aghast, then rubbing their arms, holding their elbows, and shaking their fingers, they capered about with pain and amazement, declaring that their arms were broken, and that the Evil One must be in the tub in the shape of an eel. They were now persuaded that it was not a simple blow of the tail they had felt before; but they could not be prevailed on to make another attempt to take out the fish, but stole away, abusing the trick about the cook and the eel.

Some years ago, the writer saw the electrical eel, exhibited at the Adelaide Gallery, London, give one of the visitors a tremendous shock. The celebrated Professor Schonbein, the inventor of gun-cotton, also tried its power. "I endeavoured to endure it," he says, "with *sang froid*;" but it seems to have caused him so to contract his countenance, and to make such curious gestures, that his friends standing by burst into loud peals of laughter. A few days before this, Captain Basil Hall, and a life-guardsman, who came on the boards with his sword and cuirass, were alike laid prostrate by a shock. And to mention only one more instance, when six or seven persons joined hands, the one at the extremity of the line near the tail touching that part, while the one near the head touched that also, the whole party felt a succession of shocks, which caused them to jump and scream, and deprived them of all inclination for another experiment.

The organ of the eel which produces such singular effects, occupies the under-part of the tail, or terminal portion of the body, and consists of four longitudinal masses, two large ones above, and two small ones below. Each mass is composed of a vast number of membraneous laminæ, or thin plates, closely set together, and nearly horizontal. These plates have their external margin affixed to the skin, and they rise to a level with the vertebral column; they are also united to each other by an infinite number of small transversal plates, and thus a multitude of transverse cells is formed. These cells are filled with a gelatinous matter, abundantly supplied with nerves, and on these nerves depend the eel's electrical power. But how, or in what manner, an accumulation of the electrical fluid takes place, or how it is that the animal discharges it, and that in any direction at its pleasure, are questions which, at present, we have no means of resolving. Here is one of innumerable instances in which we are stopped by impassable barriers in the progress of our investigations among the wonders with which the great field of creation teems. How soon do we discover the limitation of our faculties and their inadequacy to grasp but a small part of the ways and workings of the Almighty!

But why, it may be asked, has the eel this electrical power? To this it may be replied, as the means of securing its natural prey. Only let live fish be put into the tub in which the eel swims about, and let it be disposed to have a meal, and by a discharge of its artillery they are instantly killed, and are swallowed at its pleasure. Its power of making this discharge has been repeatedly proved to be under its own control. In wounded animals, it is usually more feeble, and sometimes it appears to be reduced to the lowest degree. But it is not always so; for it has occasionally happened that persons have handled an apparently exhausted eel for some time, without any shock being experienced, when all at once its battery has been discharged with the greatest effect. Several times Humboldt was bold enough to hold one of these fishes by the tail, and even to pinch it; yet he received no shock till his fellow-traveller, Bonpland, tickled it on the belly, or on the gill covers. At this crisis the shock to Humboldt was terrible, while Bonpland was conscious of no sensation. When two persons touch at once the space occupied by the electric apparatus, their fingers being two inches apart, it is seldom that both are affected by the electrical explosion at the same time. It depends, indeed, on the will of the animal to which of the objects touching it it should direct the electric fluid, or, still more strange to say—whether it will call up this or that portion of its electrical battery into action. When two persons touch the eel, each with a metallic rod, and bring the ends of the rod on the body of the animal to within five or six lines of each other, both are not affected simultaneously, for the eel discharges its electricity first through one rod, and then through the other, giving a shock to each holder in succession. It is found that when tickled on the under surface, on the pectoral fin, on the lips, eyes, and especially the gill covers, that the animal gives the most violent concussions. These parts seem to be peculiarly sensitive, and the skin over them is very delicate.

That the electricity in action is the ordinary electricity, is proved by its producing the same effects. One evidence is afforded by the shocks it produces. "I never remember," says Humboldt, "to have experienced a more terrible blow from the discharge of a Leyden jar of great size than one which I received on putting my two feet on an electrical eel which was dragged out of the water. During the rest of the day I felt great pain in the knees, and in almost every joint of my body. A blow on the stomach, a stone falling on the head, a tremendous electric explosion, produce, in an instant, the same effects: nothing is distinguished, all is vague, when the whole nervous system is thus shocked violently at the same moment." The writer has seen other phenomena arising from the active power of the eel—as the electrical spark and the deflagration of gold leaves, these leaves being mutually attracted from a sensible distance, and actually burning on coming into contact.

The method by which the electrical eel is captured is an interesting process. Groups of Indians surround the pools which abound with this peculiar species of eel. The Indians make a sort of *battue* in collecting horses and mules, and force them to enter the pool. With bristling manes and eyes gleaming with pain the horses endeavour to escape; the yellow and livid eels swim like large aquatic serpents on the surface of the water, gliding under the bellies of their antagonists and discharging their electricity. The horses and mules stunned by the force and repetition of the shocks, flounder and sometimes sink. But when the battle has lasted about a quarter of an hour they appear less terrified. The eels instead of attacking the horses endeavour to escape, their electrical power is for the time destroyed, and they are readily captured by the Indians.

Humboldt, in describing the capture of electrical eels, says: "When the eels came towards the banks they were very easily taken; little harpoons attached to long cords were thrown at them, and two were sometimes caught at once, and that without a shock being felt, the cord being very dry and of considerable length. In a few minutes five large eels were landed, and more might have been taken had they been needed. Most were only slightly wounded in the tail." They were then transferred to little pits filled with fresh water, which had been made on the banks to receive them.